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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,752	02/03/2004	Naoki Oguchi	1341.1182	9761
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STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER SAMUEL, DEWANDA A	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/769,752	Applicant(s) OGUCHI ET AL.	
	Examiner DeWanda Samuel	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-44 is/are allowed.
- 6) ☒ Claim(s) 1,10,11 and 18-23 is/are rejected.
- 7) ☐ Claim(s) 2-9 and 13-17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 18-23 are rejected under 35 U.S.C. 101 because, it claims a "A computer program product for processing a packet between a forwarding device and a control device", The claimed subject matter is nonstatutory functional descriptive material as stated in the MPEP 2106 Patentable Subject Matter. It is suggested that the applicant rewrite claims 17-25 in terms of" a computer readable medium, stored with, embodied with or encoded with a computer program or computer executable instructions."

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1,10,11,12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Putzolu et al. (Us Patent 7,203,740) in view of Terrell et al.(PG PUB 2007/0033413) and Subramanian et al. (US Patent 6,970,943).

With regard to claim 1, Putzolu et al. discloses having a *packet processing system comprising*; Putzolu et al. discloses having a forwarding device that transmits and receives a packet through a network interface; Putzolu et al. discloses having a proprietary forwarding element 210 in fig. 4 which is capable of forwarding and processing data packets (column 4 line 5-8).
and a control device that transfers the packet between the control device and the forwarding device, and responds to the packet using an application, Putzolu et al. discloses having a control element 230 in fig. 4 that handles all control functions , including routing and signaling protocols (column 4 line 5-8)...responds to a packet using a network service API (application program interface) 240 in fig. 3 controls/modify the behavior of the data forwarding path in both the data and control planes (column 5 line 55-58).

wherein the control device includes a symbol section that is associated with address information of the forwarding device; and a first transfer control section that when detecting that the application accesses the symbol section, sets a

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packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device, Putzolu et al. discloses having a control element 230 with a network service API (application program interface) 240 in fig. 3 controls/modify the behavior of the data forwarding path in both the data and control planes (column 5 line 55-58).

However, Putzolu et al. does not explicitly disclose having control device includes a symbol section that is associated with address information of the forwarding device and a first transfer control section that when detecting that the application accesses the symbol section, sets a packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device. Terrell et al. discloses having a system for secure data communication...network 102 includes servers 110, clients 120 and network devices 130...server 110 ("control device") provides data storage and application hosting to support conventional distributed processing applications programs...server functions may include web suite hosting, application service provision, internet service provisioning (page 2 paragraph 19 line 1-6). Terrell et al. further discloses data is identified by the application program according to its virtual address, the virtual address specified in an application are generally relative to the value of a base register maintained by the operating system and a map maintained by a memory management unit (MMU, page 3 paragraph 25 line 1-8).

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However, Terrell et al. does not explicitly disclose sets a packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device. Subramanian et al. discloses having a routing architecture including a compute plane, control plane and a forward plane...in fig. 1 the control plane which provides the overall control and configuration for the routing node 10...this control may range from running diagnostics to setting configurations for the compute plane 14 and the forward plane 16. These settings may dictate the type of processing to carry out on the incoming packets and which plane handles the processing (column 4 line 25-32)...the network API 24 can be used to instruct the forward plane 16 to alter packet processing through the installation of hardware or software filters that facilitate forwarding rules these filters execute actions specified by a defined filter policy (column 4 line 46-50).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a control element 230 as taught by Putzolu et al. generating a virtual address in the base register of the operating system ("symbol section") as taught by Terrell et al. and invoking a network API 244 to instruct a forward plane 16 to enforce forwarding rules as taught by Subramanian et al. to efficiently process packets within the network.

and the forwarding device includes a second transfer control section that sets the packet transfer rule in response to the setting request. Putzolu et al. discloses

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having a switching node 10 comprised of a forwarding element 210 ("forwarding device") which includes a plurality of forwarding rules 50 ("packet transfer rule") that facilitates packet filtering and delivering to the control plane... and the next hop or destination (fig. 6 and column 8 line 14-25). It is inferred the element 210 ("forwarding device") is capable of responding to a forwarding request according to the forwarding rules 50.

With regard to claim 10, in combination Putzolu et al., Terrell et al., and Subramanian et al. teaches the packet processing system recited in claim 1. *wherein the application is a path control process of a router.* Putzolu et al. that the forwarding element 210 that handles the data or packet forwarding functions ...the example of the forwarding element 210 is a router (column 6 line.11-16).

With regard to claim 11, in combination Putzolu et al., Terrell et al., and Subramanian et al. teaches the packet processing system recited in claim 1. *wherein the control device and the forwarding device are connected to each other through a data link layer, and exchange data there between using a protocol for the data link layer.* Putzolu et al. that the forwarding element 210 may be a layer 2 ("data link layer") device and include all layer 2 capabilities (column 6 line 11-20).

With regard to claim 12, Putzolu discloses having a *method of processing a packet between a forwarding device and a control device, the*

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forwarding device transmitting and receiving the packet through a network interface, the control device responding to the packet using an application, the method comprising: associating a symbol section with address information of the forwarding device; a forwarding device that transmits and receives a packet through a network interface; Putzolu et al. discloses having a proprietary forwarding element 210 in fig. 4 which is capable of forwarding and processing data packets (column 4 line 5-8). Putzolu et al. discloses having a control element 230 in fig. 4 that handles all control functions , including routing and signaling protocols (column 4 line 5-8)...responds to a packet using a network service API (application program interface) 240 in fig. 3 controls/modify the behavior of the data forwarding path in both the data and control planes (column 5 line 55-58).

transmitting from the control device to the forwarding device a setting request that the forwarding device sets a packet transfer rule that is used to transfer the packet received to the control device, when the control device detects that the application accesses the symbol section; Putzolu et al. discloses having a control element 230 with a network service API (application program interface) 240 in fig. 3 controls/modify the behavior of the data forwarding path in both the data and control planes (column 5 line 55-58).

However, Putzolu et al. does not explicitly disclose having control device includes a symbol section that is associated with address information of the forwarding device and a first transfer control section that when detecting that the

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application accesses the symbol section, sets a packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device. Terrell et al. discloses having a system for secure data communication... network 102 includes servers 110, clients 120 and network devices 130... server 110 ("control device") provides data storage and application hosting to support conventional distributed processing applications programs... server functions may include web suite hosting, application service provision, internet service provisioning (page 2 paragraph 19 line 1-6). Terrell et al. further discloses data is identified by the application program according to its virtual address, the virtual address specified in an application are generally relative to the value of a base register maintained by the operating system and a map maintained by a memory management unit (MMU, page 3 paragraph 25 line 1-8).

However, Terrell et al. does not explicitly discloses sets a packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device. Subramanian et al. discloses having a routing architecture including a compute plane, control plane and a forward plane... in fig. 1 the control plane which provides the overall control and configuration for the routing node 10... this control may range from running diagnostics to setting configurations for the compute plane 14 and the forward plane 16. These settings may dictate the type of processing to carry out on the

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incoming packets and which plane handles the processing (column 4 line 25-32)... the network API 24 can be used to instruct the forward plane 16 to alter packet processing through the installation of hardware or software filters that facilitate forwarding rules these filters execute actions specified by a defined filter policy (column 4 line 46-50).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a control element 230 as taught by Putzolu et al. generating a virtual address in the base register of the operating system ("symbol section") as taught by Terrell et al. and invoking a network API 244 to instruct a forward plane 16 to enforce forwarding rules as taught by Subramanian et al. to efficiently process packets within the network.

setting the packet transfer rule in the control device; and setting the packet transfer rule in response to the setting request in the forwarding device; Putzolu et al. discloses having a switching node 10 comprised of a forwarding element 210 ("forwarding device") which includes a plurality of forwarding rules 50 ("packet transfer rule") that facilitates packet filtering and delivering to the control plane... and the next hop or destination (fig. 6 and column 8 line 14-25). It is inferred the element 210 ("forwarding device") is capable of responding to a forwarding request according to the forwarding rules 50.

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With regard to claim 18, Putzulo discloses having a *computer program product for processing a packet between a forwarding device and a control device, the forwarding device transmitting and receiving the packet through a network interface*, Putzolu et al. discloses having a proprietary forwarding element 210 in fig. 4 which is capable of forwarding and processing data packets (column 4 line 5-8).

a control device responding to the packet using an application, the computer program product including computer executable instructions stored on a computer readable medium, wherein the instructions, when executed by the computer, cause the computer to perform: Putzolu et al. discloses having a control element 230 in fig. 4 that handles all control functions , including routing and signaling protocols (column 4 line 5-8)...responds to a packet using a network service API (application program interface) 240 in fig. 3 controls/modify the behavior of the data forwarding path in both the data and control planes (column 5 line 55-58).

associating a symbol section with address information of the forwarding device; transmitting from the control device to the forwarding device a setting request that the forwarding device sets a packet transfer rule that is used to transfer the packet received to the control device, when the control device detects that the application accesses the symbol section; Putzolu et al. discloses having a control element 230 with a network service API (application program interface) 240 in fig.

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3 controls/modify the behavior of the data forwarding path in both the data and control planes (column 5 line 55-58).

However, Putzolu et al. does not explicitly disclose having control device includes a symbol section that is associated with address information of the forwarding device and a first transfer control section that when detecting that the application accesses the symbol section, sets a packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device. Terrell et al. discloses having a system for secure data communication... network 102 includes servers 110, clients 120 and network devices 130... server 110 ("control device") provides data storage and application hosting to support conventional distributed processing applications programs... server functions may include web suite hosting, application service provision, internet service provisioning (page 2 paragraph 19 line 1-6). Terrell et al. further discloses data is identified by the application program according to its virtual address, the virtual address specified in an application are generally relative to the value of a base register maintained by the operating system and a map maintained by a memory management unit (MMU, page 3 paragraph 25 line 1-8).

However, Terrell et al. does not explicitly discloses sets a packet transfer rule in the forwarding device by transmitting to the forwarding device a setting request that the forwarding device sets the packet transfer rule that is used to transfer the received packet to the control device. Subramanian et al. discloses

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having a routing architecture including a compute plane, control plane and a forward plane...in fig. 1 the control plane which provides the overall control and configuration for the routing node 10...this control may range from running diagnostics to setting configurations for the compute plane 14 and the forward plane 16. These settings may dictate the type of processing to carry out on the incoming packets and which plane handles the processing (column 4 line 25-32)...the network API 24 can be used to instruct the forward plane 16 to alter packet processing through the installation of hardware or software filters that facilitate forwarding rules these filters execute actions specified by a defined filter policy (column 4 line 46-50).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have a control element 230 as taught by Putzolu et al. generating a virtual address in the base register of the operating system ("symbol section") as taught by Terrell et al. and invoking a network API 244 to instruct a forward plane 16 to enforce forwarding rules as taught by Subramanian et al. to efficiently process packets within the network.

setting the packet transfer rule in the control device; and setting the packet transfer rule in response to the setting request in the forwarding device. Putzolu et al. discloses having a switching node 10 comprised of a forwarding element 210 ("forwarding device") which includes a plurality of forwarding rules 50 ("packet transfer rule") that facilitates packet filtering and delivering to the control plane...and the next hop or destination (fig. 6 and column 8 line 14-25). It is

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inferred the element 210 ("forwarding device") is capable of responding to a forwarding request according to the forwarding rules 50.

Allowable Subject Matter

5. **Claims 2-9, 13-17 and 19-23** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. **Claims 24-30, 31-37, and 38-44** are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Examiner's statement of reason's for allowance: Putzolu et al. discloses having a discloses having a computer system allowing proprietary forwarding elements to interoperate with standard control elements in an open network architecture. Putzulo et al. further discloses the control element is adapted to perform signaling and control functions of the computer network and the forwarding element id adapted to perform data forwarding functions in the computer network. However, the prior art fails to anticipate or render obvious the following specific recited features: Claim 24 limitation : A packet processing system which performs communication with a network node through a network interface of a forwarding device, wherein the network interface of the forwarding device and application on a control device are connected to each other by an internal communication path, the control device includes a symbol setting unit

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that sets a symbol section that communicates with the application on the control device and associates it with an interface of the forwarding device; a first downstream path generation unit that receives from the forwarding device a downstream internal communication path identifier of a downstream internal communication path on which data is transferred in a direction from the symbol section to the interface of the forwarding device, and that generates a first downstream path table where the downstream internal path identifier is associated with the symbol section and an address of the forwarding device; a first upstream path generation unit that receives a start message that the application starts communicating with the symbol section, that transmits an input-output port identifier of the process and an upstream internal communication path identifier to the forwarding device, and that generates a first upstream path table where the upstream internal path identifier is associated with the symbol section and the input-output port identifier, and the forwarding device includes a second downstream path generation unit that generates a second downstream path table where the downstream internal path identifier is associated with the interface of the forwarding device; and a second upstream path generation unit that generates a second upstream path table where the input-output port identifier of the process, the upstream internal communication path identifier, and the interface are associated with each other. Claims 31 and 38 are interpreted same as claim 24.

Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bahl (US 7,003,574) discloses having a session load balancing and use of VIP as source address for inter-cluster traffic through the use of a session identifier.

Yang et al. (Forwarding and Control element separation (ForCES) Framework, 2002) discloses a framework and associated protocol (s) to standardize information exchange between the control and forwarding plane.

Biswase et al. ("The IEEE P1520 Standards Initiative for Programmable Network Interfaces", 1998) discloses standard software interfaces fro programming networks.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DeWanda Samuel whose telephone number is (571) 270-1213. The examiner can normally be reached on Monday-Thursday 8:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DeWanda Samuel
11/18/2007



RICKY Q. NGO
SUPERVISORY PATENT EXAMINER